



# Research Note

## Safety Belt Use in 2002 – Demographic Characteristics

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Safety belt use among African Americans rose to 77%, a sizable 8-point gain over their use two years ago. More than a quarter of Blacks who were not using belts in 2000 used them in 2002. These results are from the National Occupant Protection Use Survey (NOPUS), which is the only probability-based observational survey of safety belt use in the United States. The survey also found:

- The belt gender gap appears to be narrowing. Males registered a 5-point gain, which reduced the gap from 10 to 7 points. Males now use belts 72% of the time, while females use 79% of the time.
- Belt use has increased dramatically among older children, with 82% of 8-15 year-olds now using belts.
- Belt use has increased in rural areas.

NOPUS is conducted periodically by the National Center for Statistics and Analysis (NCSA) in the National Highway Traffic Safety Administration (NHTSA). The data in this note were collected between June 3, 2002 and June 22, 2002, during which approximately 38,000 drivers and 12,000 passengers were observed at 1,141 randomly selected road sites. This note supplements the 2002 NOPUS data reported in [N], which contains results on belt use by such characteristics as time of day and type of belt enforcement law.

### New Age Categories in 2002

Prior to 2002, NOPUS had observed demographic characteristics (age, race, gender,

and urbanization) for front seat outboard occupants over the age of 4. This year, changes instituted to incorporate booster seat use resulted in restricting the collection of demographic data to those occupants over the age of 7. (The age range 4-7 comprises most of the children who should be in booster seats, and so this group was added as a category of children in NOPUS. Results on the restraint use of these children, as well as children under 4, can be found in [C].) That is, the NOPUS age groups in this note changed as follows in 2002.

**Table 1: Changes in NOPUS Age Groups**

Age Group	Definition in	
	1994-2000	2002
Youth	5-15	8-15
Young Adult	16-24	16-24
Adult	25-69	25-69
Senior	70+	70+

Because of the definitional change in the Youth age category, caution should be exercised when comparing Youth estimates from 2000 with those from 2002. While the age category of 5-15 in 2000 is most comparable to the 8-15 category in 2002, the increased belt use among Youth in 2002 could reflect the omission of 5-7 year olds in 2002, an actual increase in use, or both. Similarly, any changes in the 2000 and 2002 estimates on race, gender, or urbanization could be due in whole or in part to the different age ranges observed in these years (ages 5 and older in 2000, versus 8 and older in 2002).

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## Changes in 2002 to Improve Reliability

NOPUS collects demographic information at intersections that are controlled by a stop sign or stoplight, where stopped traffic permits the collection of several data items. In previous years, NOPUS collected this data at the controlled intersections that were employed by the NOPUS Moving Traffic Study. [G] In the period 1994-1998, there were approximately 2,000 such controlled intersection sites, while a reduction in the sample and a definitional change in 2000 cut these to about 700 (erroneously stated as 1,200 in [D]). Starting in 2002, demographic data were also collected at any controlled intersection that the data collectors could find on the road segment selected in the previous sampling stage of the Moving Traffic sample for those 1,300 Moving Traffic sites that are not controlled intersections. The enlarged demographic sample remains effectively a probability sample, since the road segments were selected probabilistically, and only the determination of a controlled intersection on certain road segments was not probabilistic. For more information on NOPUS's sample design, see [N].

The addition of new sites substantially improved NOPUS's demographic estimates. In 2000, 12,000 vehicles were observed at 700 sites, compared to 38,000 vehicles at 1,100 sites in 2002, cutting standard errors approximately in half.

## Design Aspects Affecting NOPUS Estimates

NOPUS conducts its observations during daylight hours, during which data collectors observe the shoulder belt use of drivers and right front passengers in passenger vehicles having no commercial markings, at intersections that are controlled by a stop sign or stoplight. NOPUS includes the first vehicle to stop at the intersection, although these occupants might tend to have higher levels of restraint use. Classifications of age, race, and urbanization are made according to the best judgment of the data collectors. These protocols may slightly bias the

estimates. In particular, belt use might be lower at night and in the rear seat. It is not clear what the net effect of misclassifications of age, race, and urbanization is. However, although controlled intersections tend to exhibit higher use rates than general road sites (because such intersections are more common in urban areas), the estimates in this report have been adjusted using the NOPUS Moving Traffic Study in a manner that reflects use on general roadways. [N] That is, the data in this note describe belt use in the front outboard seating positions in passenger vehicles (with no commercial markings) during daylight hours, on general roadways.

## Conversion Rates

The tables in this note give the use rates, changes in use in 2000-2002, the sampling errors of both of these statistics, and the *conversion rates* of the 2000-2002 changes. The conversion rate is the percentage reduction in nonuse and represents the percent of nonusers who were "converted" to using belts in the specified time period. For instance, nonuse among males was reduced by 15% in 2000-2002, which, for simplicity, the reader might think of as follows: 15% of the males who were not using belts in 2000 were using them in 2002.

## African Americans Register a Major Gain

Belt use among Blacks increased 8 percentage points, from 69% in 2000 to 77% in 2002. More than a quarter of African Americans who weren't using belts in 2000 were using them in 2002. The increase among Blacks is statistically significant with 89% confidence. These improvements are due in substantial part to efforts by NHTSA's partners, such as Meharry Medical College and the Blue Ribbon Panel to Increase Seat Belt Use Among African Americans.

NOPUS has never detected a statistically significant difference in belt use among the races. However, the 2002 survey observed many more minorities than previous surveys (38,000 Whites, 6,000 Blacks, and 5,000 other

individuals), and so was more capable of detecting a difference.

Belt use by members of other racial groups (those not characterized as White or Black by the data collectors) increased 9 percentage points, to 78% use. Data collectors are instructed to categorize occupants who appear to be White Hispanic, Asian American, or American Indian as members of the Other category. Racial categorizations based on observation are, of course, susceptible to error, and we cannot estimate its impact on the belt use estimates. NOPUS does not observe ethnicity. It will be interesting to see whether the gains seen among minorities in NOPUS are born out in the NHTSAs Motor Vehicle Occupant Safety Survey, whose racial and ethnic data are more reliably obtained through interviews. [M]

That all racial estimates (White, Black, and Other) exceed the national estimate of 75% is an artifact of the estimator used by the survey. Each excess is within sampling error. Although they are mutually inconsistent, the estimates of 75% national use, 76% white use, 77% black use, and 78% use by other races were obtained scientifically and are the best estimates available.

### **The Gender Gap Might Be Closing**

Since its inception in 1994, NOPUS has generally seen a 10-point gap in belt use by males and females, with females consistently found to use belts more. In 2002, the disparity has narrowed to 7 points, with females using belts 79% of the time, compared to 72% for males.

The narrowing of the gap is due largely to the 5-point increase in male use, which corresponds to a 15% conversion rate. We are 86% confident that males used belts more in 2002 than they did in 2000. However, female use continues to be statistically higher than male use.

The lower use by males has substantial consequences. The vast majority of the thousands of lives that are lost each year from

not using belts are male. [L] This is partly because males use belts less and partly because they are on the road more.

### **Older Children Are Using Belts More**

Belt use increased among older children, from 66% among 5-15 year olds in 2000 to 82% among 8-15 year olds in 2002. This increase is statistically significant, and older children saw some of the largest conversion rates in 2002. However this substantial increase in use might be due in whole or in part to the change in age range. In addition, these estimates, and all age estimates, are influenced by the difficulty of assessing age through observation, and we cannot measure the extent to which age misclassifications affect the estimates.

### **Age Now a Significant Factor in Belt Use**

Among its age categories, NOPUS generally sees the lowest belt use among young adults (16-24), and use generally increases with age among people 16 and over. These differences, however, were previously not statistically significant, perhaps because the previous surveys did not observe at sufficiently many sites to detect a difference. With the enlarged sample used in the 2002 survey, age is now a significant factor in belt use. Occupants ages 8-15 and those 70 and over use belts more than those in 25-69 age range, while 16-24 year olds use belts less often.

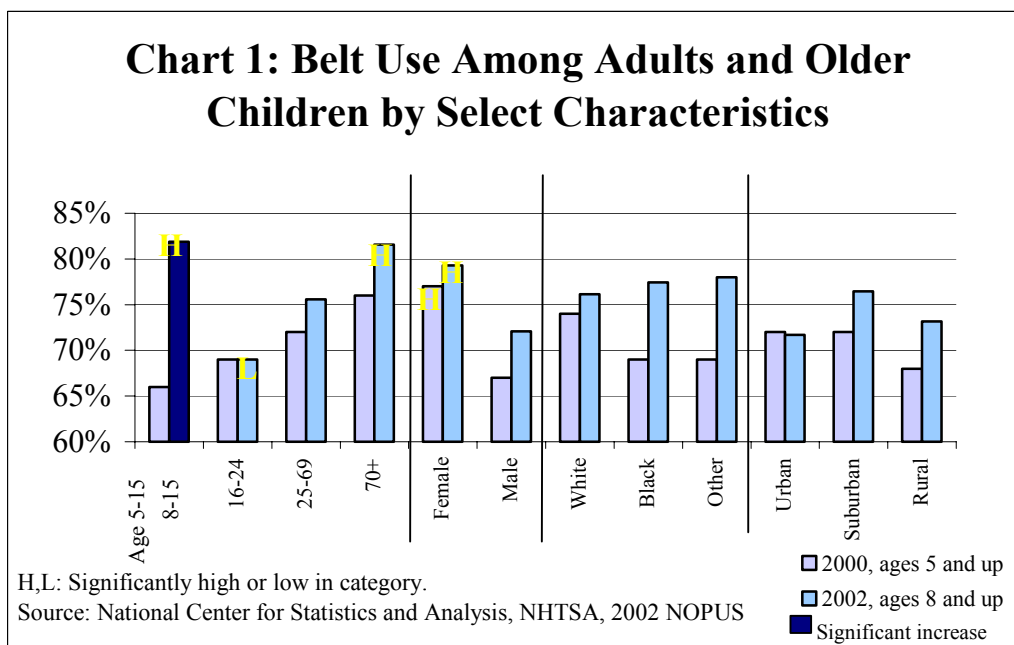
### **Use Increases in Rural Areas**

Belt use in rural areas increased 5 points, from 68% in 2000 to 73% in 2002. Belt use was found to be 72% in urban areas and 76% in suburban areas.

Urbanization is assessed subjectively by the data collectors, and this may impact the estimates. In addition, note that occupants observed in rural areas might or might not live in a rural area.

NOPUS has consistently found belt use to be statistically similar in urban, rural, and suburban areas. However, the increased reliability of the 2002 data means that the finding of similarity in

2002 is more likely due to an actual similarity, rather than sampling error.



**Table 1: Belt Use Among Adults and Older Children by Select Characteristics**

Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Age 5-15 or 8-15	82% (H)	2.4%	66%	7.4%	16% (S)	7.8%	47%
16-24	69% (L)	1.9%	69%	3.5%	0%	4.0%	0%
25-69	76%	1.7%	72%	3.0%	4%	3.4%	14%
70+	82% (H)	1.9%	76%	3.7%	6%	4.1%	25%
Female	79% (H)	1.7%	77% (H)	2.6%	2%	3.1%	9%
Male	72%	1.6%	67%	3.0%	5%	3.4%	15%
White	76%	1.6%	74%	2.9%	2%	3.3%	8%
Black	77%	2.2%	69%	4.8%	8%	5.3%	26%
Other	78%	1.9%	69%	5.9%	9%	6.2%	29%
Urban	72%	2.0%	72%	7.0%	0%	7.3%	-1%
Suburban	76%	2.7%	72%	2.9%	4%	3.9%	16%
Rural	73%	2.2%	68%	3.7%	5%	4.3%	16%

\*H,L: significantly high or low use in its category.

#S: significant 2000-2002 change.

Source: National Center for Statistics and Analysis, NHTSA, NOPUS, 2000, 2002.

## Survey Design

The results in this note were observed during the Controlled Intersection Study of NOPUS. This survey uses a multi-stage probability sample of roadways to ensure reliable estimates. The

Controlled Intersection sample consists of intersections that are controlled by a stop sign or a stoplight, at which stopped and slowed traffic permit detailed observation. For a complete description of the sample design, see [N]. Data

collectors observe belt use and demographic characteristics (race, age, gender) of the drivers and right front passengers of passenger vehicles during daylight hours between 10 AM and 6 PM. Demographic classifications, as well as urbanization, are made according to the best determination of the data collectors. The results in this note were obtained at 1,141 sites between June 3, 2002 and June 22, 2002, at which 38,000 vehicles were observed. Approximately 22,000 drivers were observed in passenger cars, 10,000 in vans and sport utility vehicles (SUVs), and 6,000 in pickup trucks. Likewise, 7,000 passengers were observed in passenger vehicles, 3,000 in vans and SUVs, and 2,000 in pickup trucks.

The field data is entered, edited, and missing values of certain variables (race, age, and gender) imputed. Estimates and sampling errors are computed incorporating the complex sample design. Estimates are adjusted so that the estimates of national belt use in the 2002 Moving Traffic and Controlled Intersection

studies agree. This ensures that the Controlled Intersection estimates represent use on general roadways. Although we plan to use direct estimation of variances of differences in future surveys, the variances on the 2000-2002 differences in this note are based on the assumption that the 2000 and 2002 surveys are independent.

## Assessing Significance

Because NOPUS uses a probability sample, one can calculate the error its estimates incur from observing use for a sample of roadways and times rather than for all roads and times. The actual quantity being estimated by a NOPUS estimate is within twice the standard error of the estimated value with 95% confidence. (Standard errors are provided in the tables in this note.) This computation can be used to determine whether differences, such as the difference in belt phone use among males and females in passenger cars, are statistically significant. See [N] for detailed examples of such calculations.

## Additional Tables

**Table 2: Belt Use by Age and Vehicle Type**

Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Age 5-15 or 8-15	82%	2.4%	66%	7.4%	16% (S)	7.8%	47%
Passenger Cars	82%	2.6%	72%	8.3%	10%	8.7%	36%
Vans & SUVs	87%	2.6%	75%	8.8%	12%	9.2%	48%
Pickup Trucks	72%	10.4%	45%	12.7%	27%	16.4%	49%
Age 16-24	69%	1.9%	69%	3.5%	0%	4.0%	0%
Passenger Cars	69%	1.8%	73%	4.3%	-4%	4.7%	-15%
Vans & SUVs	74%	3.2%	65%	5.3%	9%	6.2%	26%
Pickup Trucks	63%	4.2%	50%	9.2%	13%	10.1%	26%
Age 25-69	76%	1.7%	72%	3.0%	4%	3.4%	14%
Passenger Cars	78%	1.8%	74%	3.0%	4%	3.5%	15%
Vans & SUVs	78%	1.4%	75%	4.0%	3%	4.3%	12%
Pickup Trucks	64% (L)	3.1%	59% (L)	5.4%	5%	6.2%	12%
Age 70 and Older	82%	1.9%	76%	3.7%	6%	4.1%	25%
Passenger Cars	82%	2.0%	78%	4.2%	4%	4.7%	18%
Vans & SUVs	87%	2.4%	76%	5.7%	11%	6.2%	46%
Pickup Trucks	72% (L)	4.2%	62%	11.3%	10%	12.1%	26%

\*H,L: significantly high or low use in its category.

#S: significant 2000-2002 change.

Source: National Center for Statistics and Analysis, NHTSA, NOPUS, 2000, 2002.

**Table 3: Belt Use by Gender and Vehicle Type**

Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Females	79%	1.7%	77%	2.6%	2%	3.1%	9%
Passenger Cars	80%	1.6%	76%	3.0%	4%	3.4%	17%
Vans & SUVs	82%	1.6%	76%	5.0%	6%	5.3%	25%
Pickup Trucks	71% (L)	4.5%	62%	5.3%	9%	6.9%	24%
Males	72%	1.6%	67%	3.0%	5%	3.4%	15%
Passenger Cars	74%	1.9%	70%	2.8%	4%	3.4%	13%
Vans & SUVs	74%	1.8%	71%	3.3%	3%	3.7%	10%
Pickup Trucks	65% (L)	2.4%	58% (L)	5.3%	7%	5.8%	17%

\*H,L: significantly high or low use in its category.

#S: significant 2000-2002 change.

Source: National Center for Statistics and Analysis, NHTSA, NOPUS, 2000, 2002.

**Table 4: Belt Use by Race and Vehicle Type**

Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Whites	76%	1.6%	74%	2.9%	2%	3.3%	8%
Passenger Cars	78%	1.7%	77%	2.9%	1%	3.3%	4%
Vans & SUVs	79%	1.7%	75%	2.9%	4%	3.3%	16%
Pickup Trucks	66% (L)	3.0%	57% (L)	4.8%	9%	5.7%	21%
Blacks	77%	2.2%	69%	4.8%	8%	5.3%	26%
Passenger Cars	78%	2.1%	68%	5.2%	10%	5.6%	31%
Vans & SUVs	78%	4.1%	69%	6.3%	9%	7.5%	29%
Pickup Trucks	68%	5.8%	53%	14.3%	15%	15.4%	32%
Other Races	78%	1.9%	69%	5.9%	9%	6.2%	29%
Passenger Cars	79%	2.1%	69%	7.1%	10%	7.4%	32%
Vans & SUVs	76%	4.3%	78%	3.9%	-2%	5.8%	-9%
Pickup Trucks	74%	3.0%	78%	9.7%	-4%	10.2%	-18%

\*H,L: significantly high or low use in its category.

#S: significant 2000-2002 change.

Source: National Center for Statistics and Analysis, NHTSA, NOPUS, 2000, 2002.

**Table 5: Belt Use by Urbanization and Vehicle Type**

Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Urban	72%	2.5%	72%	7.0%	0%	7.4%	0%
Passenger Cars	72%	2.6%	73%	6.8%	-1%	7.3%	-4%
Vans & SUVs	72%	3.0%	70%	7.2%	2%	7.8%	7%
Pickup Trucks	69%	3.8%	67%	10.2%	2%	10.9%	6%
Suburban	76%	1.8%	72%	2.9%	4%	3.4%	14%
Passenger Cars	78%	2.1%	74%	3.1%	4%	3.7%	15%
Vans & SUVs	79%	1.6%	78%	2.6%	1%	3.1%	5%
Pickup Trucks	69% (L)	2.7%	56% (L)	5.6%	13% (S)	6.2%	30%



Characteristic	Use in 2002 Among Ages 8 and Older		Use in 2000 Among Ages 5 and Older		2000-2002 Change		
	Estimate*	Standard Error	Estimate*	Standard Error	Estimate#	Standard Error	Conversion Rate
Rural	73%	2.2%	69%	3.7%	4%	4.3%	13%
Passenger Cars	79%	1.3%	71%	5.1%	8%	5.3%	28%
Vans & SUVs	78%	1.8%	74%	5.7%	4%	6.0%	15%
Pickup Trucks	54% (L)	6.0%	55% (L)	5.2%	-1%	7.9%	-2%

\*H,L: significantly high or low use in its category.

#S: significant 2000-2002 change.

Source: National Center for Statistics and Analysis, NHTSA, NOPUS, 2000, 2002.

## References

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[N] D. Glassbrenner, *Safety Belt and Helmet Use in 2002 – Overall Results*, NHTSA Technical Report, DOT HS 809 500, September 2002

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